

# Climate-Smart Conservation

*Putting Adaptation Principles into Practice*



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*Climate-Smart Conservation* is available online at: [www.nwf.org/ClimateSmartGuide](http://www.nwf.org/ClimateSmartGuide)

Cover: Beaver pond in Grand Teton National Park, Wyoming. Maintaining or reestablishing healthy beaver populations can serve as an adaptation strategy for sustaining aquatic and streamside habitats in a changing climate. Photo © Carr Clifton/Minden Pictures.



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# Executive Summary

Climate change already is having significant impacts on the nation's species and ecosystems, and these effects are projected to increase considerably over time. As a result, climate change is now a primary lens through which conservation and natural resource management must be viewed. How should we prepare for and respond to the impacts of climate change on wildlife and their habitats? What should we be doing differently in light of these climatic shifts, and what actions continue to make sense? *Climate-Smart Conservation: Putting Adaptation Principles into Practice* offers guidance for designing and carrying out conservation in the face of a rapidly changing climate.

Addressing the growing threats brought about or accentuated by rapid climate change requires a fundamental shift in the practice of natural resource management and conservation. Traditionally, conservationists have focused their efforts on protecting and managing systems to maintain their current state, or to restore degraded systems back to a historical state regarded as more desirable. Conservation planners and practitioners will need to adopt forward-looking goals and implement strategies specifically designed to prepare for and adjust to current and future climatic changes, and the associated impacts on natural systems and human communities—an emerging discipline known as *climate change adaptation*.

The field of climate change adaptation is still in its infancy. Although there is increasing attention focused on the subject, much of the guidance developed to date has been general in nature, concentrating on high-level principles rather than specific actions. It is against this backdrop that this guide was prepared as a means for helping put adaptation principles into practice, and for moving adaptation from planning to action.

## Making Conservation Climate Smart

The fate of our wildlife and wild places depends on steps we take now to prepare for and cope with the growing impacts of a changing climate. While managers traditionally have looked to the past for inspiration, increasingly we will be faced with future conditions that may have no historical analogs.

Making a transition to forward-looking and climate-smart conservation will require that we pay particular attention to the following overarching themes:

**Act with intentionality.** We must explicitly consider and address climate impacts—both direct and indirect—in our conservation actions, and be able to “show our work.” Most adaptation actions will draw from existing conservation techniques, but may differ in when, where, and why they are applied. Being deliberate and transparent, however, applies regardless of whether adaptation planning indicates a needed change of course with novel strategies, or continues to validate current efforts and traditional strategies. Indeed, acting with intentionality—through linking climate impacts to conservation actions—is at the very heart of climate-smart conservation.

***What should we be doing differently in light of climate change, and what actions continue to make sense?***



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### **Manage for change, not just persistence.**

In the face of current rapid climatic shifts, change is likely to be the only constant. Accordingly, conservationists will need to learn how to respond to and manage inevitable changes, rather than assume they can forever be resisted. Increasingly, we will be faced with managing system transformations, and may need to focus on sustaining ecological functions, rather than historical assemblages of plants and animals. In practice, managers may often be faced with simultaneously carrying out persistence and change-oriented strategies, and even cycling between the two based on changing conditions.

### **Reconsider goals, not just strategies.**

As conditions change, many of our current conservation goals and management objectives may no longer be feasible. Successful climate adaptation will depend not only on adjusting management

strategies, but also in reevaluating—and revising as appropriate—our underlying conservation goals and objectives. In this sense, conservation goals can be regarded as the “ends” and strategies the “means.” A climate-informed reconsideration may not require a wholesale revision but reveal the need to modify different components of conservation goals, such as *what* (the conservation targets), *why* (the intended outcomes), *where* (the relevant geography), or *when* (the relevant time frame).

### **Integrate adaptation into existing work.**

One of the best ways to facilitate successful implementation of adaptation strategies is through integrating, or “mainstreaming,” adaptation into existing processes. Not only is it important to incorporate adaptation into existing natural resource decision processes, but opportunities are available to integrate the services from natural systems into adaptation focused on human communities and the built environment.

## What is Climate-Smart Conservation?

An important goal of this guidance is to help practitioners and policy-makers understand what constitutes “good” climate adaptation, how to recognize those characteristics in existing work, as well as how to design new interventions when necessary. Part I of this guide focuses on exploring climate-smart conservation, and offers a structured process for putting it into practice. To this end, we define “climate-smart conservation” as:

*The intentional and deliberate consideration of climate change in natural resource management, realized through adopting forward-looking goals and explicitly linking strategies to key climate impacts and vulnerabilities.*

Determining what represents appropriate and relevant adaptation is highly context specific, but there are a number of attributes that can help distinguish when and whether climate considerations are suitably being incorporated into conservation work. To assist practitioners in making that distinction, we have identified the following set of key characteristics that collectively define a climate-informed approach to conservation.

**Link actions to climate impacts.** Conservation strategies and actions are designed specifically to address the impact of climate change, in concert with existing threats; actions are supported by an explicit scientific rationale.

**Embrace forward-looking goals.** Conservation goals focus on future, rather than past, climatic and ecological conditions; strategies take a long view (decades to centuries) but account for near-term conservation challenges and needed transition strategies.

**Consider broader landscape context.** On-the-ground actions are designed in the context of broader geographic scales to account for likely shifts in species distributions, to sustain ecological processes, and to promote collaboration.

**Adopt strategies robust to uncertainty.** Strategies and actions ideally provide benefit across a range of possible future conditions to account for uncertainties in future climatic conditions, and in ecological and human responses to climate shifts.

**Employ agile and informed management.** Conservation planning and resource management is capable of continuous learning and dynamic adjustment to accommodate uncertainty, take advantage of new knowledge, and cope with rapid shifts in climatic, ecological, and socioeconomic conditions.

*Successful climate adaptation will depend not only on adjusting management strategies, but also on reevaluating underlying conservation goals.*

**Minimize carbon footprint.** Strategies and projects minimize energy use and greenhouse gas emissions, and sustain the natural ability of ecosystems to cycle, sequester, and store carbon.

**Account for climate influence on project success.** Considers how foreseeable climate impacts may compromise project success; generally avoids investing in efforts likely to be undermined by climate-related changes unless part of an intentional strategy.

**Safeguard people and nature.** Strategies and actions enhance the capacity of ecosystems to protect human communities from climate change impacts in ways that also sustain and benefit fish, wildlife, and plants.

**Avoid maladaptation.** Actions taken to address climate change impacts on human communities or natural systems do not exacerbate other climate-related vulnerabilities or undermine conservation goals and broader ecosystem sustainability.



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## The Climate-Smart Cycle

Carrying out effective climate adaptation involves an array of activities that can at first seem bewildering in their complexity and use of specialized terminology. The intent of this guide is to help natural resource practitioners understand the fundamentals of climate-smart conservation by demystifying this process and by demonstrating how the various parts of this process fit together. To that end, we offer a generalized framework for climate-smart conservation that breaks this process down into discrete steps. Each of the steps in this cycle, of course, has its own set of associated processes, and there may be multiple ways of carrying out each of these steps. Part II of this guide delves into the details of each step, together with case studies that exemplify the application of these approaches. Our primary interest is in helping practitioners understand how the pieces of the adaptation process fit together, and how to recognize when various methods and approaches may be appropriate for carrying out the different steps.

Although the climate-smart cycle mirrors many existing conservation planning and adaptive management approaches, it is designed specifically with climate change in mind. Particularly climate-focused elements include step 2—assessing climate-related vulnerabilities, and step 3—reconsidering conservation goals in light of those vulnerabilities. And while the steps are presented in a linear and stepwise fashion, depending on the specific requirements of a planning effort, one may enter the process at various stages or emphasize different components.

### Step 1. Define planning purpose and scope.

This includes: articulating the planning purpose; clarifying existing conservation goals; identifying conservation targets; specifying geographic scope and time frame; engaging key participants and partners; and determining resource needs and availability.

### Step 2. Assess climate impacts and vulnerabilities.

Understanding climate vulnerabilities is crucial for designing effective adaptation strategies, and the specific components of vulnerability—exposure, sensitivity, and adaptive capacity—can provide a useful framework for linking actions to impacts. Identification of “key vulnerabilities” provides a means for targeting the development of strategies and actions in subsequent steps of the cycle.

### Step 3. Review/revise conservation goals and objectives.

Because goals serve as the basis for subsequent strategies and actions, they should be climate-informed and forward looking. Reevaluation of goals and objectives may either validate their continued relevance, or indicate a need for refinement or modification.

### Step 4. Identify possible adaptation options.

What are possible approaches for reducing key climate-related vulnerabilities or taking advantage of newly emerging opportunities? At this stage, a broad array of alternative strategies and actions

should be identified, with particular attention to creative thinking in crafting possible management actions.

#### **Step 5. Evaluate and select adaptation actions.**

The array of possible adaptation options can now be evaluated to determine which are likely to be most effective from an ecological perspective, and most feasible from social, technical, and financial viewpoints.

#### **Step 6. Implement priority adaptation actions.**

Successfully implementing adaptation requires individual leadership as well as institutional commitment and resources, and often depends on engaging diverse partners early on, and emphasizing benefits to multiple sectors of society.

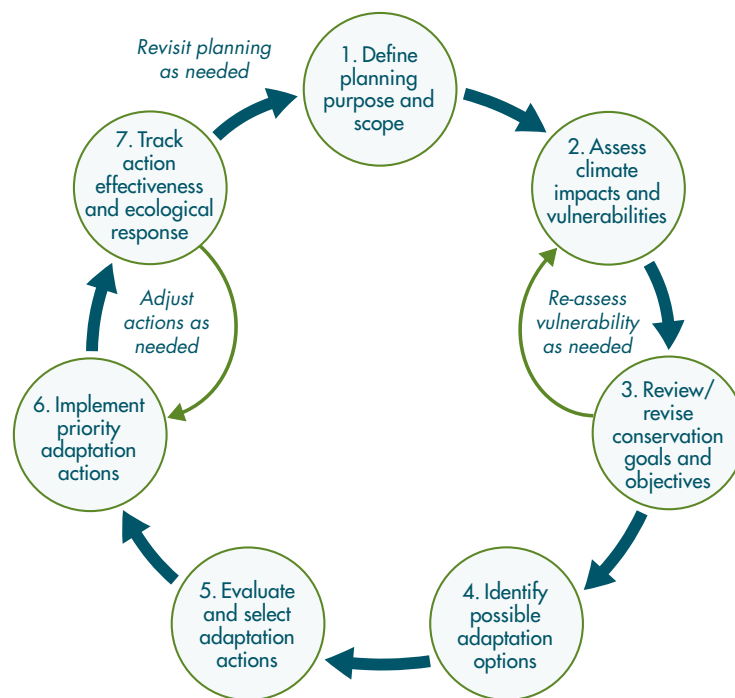
**Step 7. Track action effectiveness and ecological responses.** Monitoring helps provide context for understanding climate-related impacts and vulnerabilities and for informing agile and adaptive management. Monitoring approaches

should be carefully designed to ensure they are capable of guiding needed adjustments in strategies and actions.

## **Making Adaptation Count**

Several cross-cutting topics underlie the various steps in the climate-smart cycle, and Part III offers an in-depth look at a few that are critical for achieving effective adaptation outcomes. These topics include techniques to deal with uncertainty, find and use best available scientific information, understand and employ supportive policies, and improve how we communicate about climate change and adaptation.

Uncertainty figures prominently in how many practitioners think about climate change, sometimes creating a sense of confusion and paralysis. Uncertainty is nothing new, however, and there are a number of useful approaches for addressing uncertainty in conservation planning



### **Climate-Smart Conservation Cycle**

A General Framework for Adaptation Planning and Implementation



and decision-making. We explore several such approaches, including scenario-based planning, structured decision-making, adaptive management, and robust decision-making, with the intent of helping practitioners overcome their fear of uncertainty and instead learn to embrace it.

Climate-smart conservation necessarily relies on information from a wide array of disciplines in the biological, physical, chemical, and social sciences. The ability to accurately assess impacts and vulnerabilities, and to develop suitable adaptation strategies is highly dependent on accessing relevant data sets, and making use of appropriate analytical tools. Yet the wide range of resources available can be bewildering, and finding and understanding the right information and tools can be daunting. New information and tools are emerging constantly, and we provide entry points to some of the most important sources for scientific information and tools relevant to climate adaptation.

***The sooner we begin taking meaningful adaptation action, the more successful these efforts will be.***

Although this guide largely focuses on how conservation practitioners and natural resource managers can better incorporate climate considerations into on-the-ground conservation efforts, such efforts are strongly influenced by the policy environment in which they are carried out. Laws, regulations, and policies can either help enable climate-smart conservation, or hinder efforts to carry out climate adaptation. Accordingly, we also look at some of the ways that existing legal and policy frameworks can be used by practitioners to advance adaptation objectives, as well as highlight needed changes in the policy environment.

Climate change is still poorly understood by many people, and is the subject of a highly polarized social discourse. Because successfully designing and carrying out adaptation efforts will be highly dependent on how one communicates about the work to various stakeholders and audiences, we offer advice for communicating about climate change generally, and climate adaptation in particular.

## **We Can Make a Difference**

Each conservation challenge is unique and there are no one-size-fits-all solutions to climate adaptation. Instead, we need thoughtfully crafted adaptation strategies that take into account not only likely climatic shifts and impacts, but the specifics of the ecological resources, existing stresses and threats, and opportunities for meaningful action. *Climate-Smart Conservation: Putting Adaptation Principles into Practice* is intended to help practitioners craft such intentional and deliberate approaches to climate adaptation.

Although climate adaptation will have costs, the cost of inaction—through continuing with business as usual—is likely to be far higher. Furthermore, the *sooner* we begin the task of planning for a climate-altered future and taking meaningful adaptation action, the more successful these efforts ultimately will be. It is imperative that natural resource managers begin to act now to prepare for and manage these changes, in order to provide the best chance for cherished conservation values to endure. Putting climate-smart conservation into practice can make a difference for sustaining our nation's diverse species and ecosystems well into the future. Indeed, protecting our rich conservation legacy depends on our rising to this challenge.